

CLAIMS

1. An adhesive composition comprising the following components:
- 5 (A) an organopolysiloxane having two alkenyl groups with 4 or less carbon atoms bonded to silicon atom in one molecule and a molecular weight of 1,000 or more;
- (B) an organohydrogenpolysiloxane having at least two hydrogen atoms bonded to silicone atom in one molecule and a molecular weight of 1,000 or more;
- 10 (C) a platinum-based catalyst; and
- (D) at least one selected from the group consisting of an organic silicon compound (D-1) having at least three alkenyl groups with 4 or less carbon atoms bonded to silicon atom in one molecule and a molecular weight of less than 1,000 and an organic cyclic silicon compound (D-2) having at least three hydrogen atoms bonded to silicon atom in one molecule and a molecular weight of less than 1,200.
- 20 2. The adhesive composition of claim 1, wherein the number of hydrogen atoms contained in the component (B) and the component (D-2) is 0.4 to 6.0 times the total number of alkenyl groups contained in the component (A) and alkenyl groups contained in the component (D-1), the component (C) is contained in an amount of 10 to 1,000 ppm based on the total weight of the components (A), (B) and (D), and the component (D) is contained in an amount of 0.1 to 40 wt% based on the total weight of the components (A) and (B).
- 25 3. The adhesive composition of claim 1 or 2, wherein the component (D) is an oligomer having 3 to 8 silicon atoms.
- Sub Sub B2
A1 4. The adhesive composition of claim 1 or 2, wherein the component (D-1) is selected from the group consisting of

- boronvinyldimethylsiloxide, hexavinylsiloxane,
methacryloxypropyltris(vinyldimethylsiloxy)silane,
octavinyl-T8-silsesquioxane,
pentavinylpentamethylcyclopentasiloxane,
- 5 tetraallyloxysilane, tetraallylsilane,
tetrakis(2-methacryloxyethoxy)silane,
tetrakis(vinyldimethylsiloxy)silane,
1,1,3,3-tetravinylsiloxane, tetravinylsilane,
1,3,5,7-tetravinyl-1,3,5,7-tetramethylcyclotetrasilazane,
- 10 1,3,5,7-tetravinyl-1,3,5,7-tetramethylcyclotetrasiloxane,
tris(vinyldimethylsiloxy)methylsilane,
tris(vinyldimethylsiloxy)phenylsilane,
trivinylchlorosilane, trivinylethoxysilane,
trivinylmethoxysilane, trivinylmethylsilane,
- 15 1,3,5-trivinyl-1,1,3,5,5-pentamethyltrisiloxane,
trivinylsilane,
1,3,5-trivinyl-1,3,5-trimethylcyclotrisilazane and
1,3,5-trivinyl-1,3,5-trimethylcyclotrisiloxane.
- 20 5. The adhesive composition of claim 1 or 2, wherein the component (D-2) is selected from the group consisting of hydro-T8-silsesquioxane,
octakis(dimethylsiloxy)-T8-silsesquioxane,
methylhydrocyclosiloxane, pentamethylcyclopentasiloxane,
25 phenylhydrocyclosiloxane,
1,3,5,7-tetramethylcyclotetrasiloxane,
1,3,5,7-tetraethylcyclotetrasiloxane and
1,3,5,7-tetraethyl-2,4,6,8-tetramethylcyclotetrasilazane
- .
- 30 6. The adhesive composition of claim 1 or 2, wherein the component (D-1) is
1,3,5-trivinyl-1,3,5-trimethylcyclotrisiloxane or
1,3,5,7-tetravinyl-1,3,5,7-tetramethylcyclotetrasiloxane

SUB 3
and the component (D-2) is
1,3,5,7-tetraethylcyclotetrasiloxane or
1,3,5,7-tetramethylcyclotetrasiloxane.

5 7. The adhesive composition of claim 1, wherein the component (A) has a viscosity of 100 to 250,000 cS at 25° C.

SUB 3
8. An optical device constructed by bonding optical parts by the adhesive composition of claim 1.

10 9. The optical device of claim 8, wherein the optical parts are optical fibers, lenses, filters, optical waveguides, diffraction gratings or optically active elements.

15 10. The optical device of claim 8 or 9, wherein the optical parts are made from glass, plastics, metals or organic-inorganic composite materials.

SUB 3
11. An optical device constructed by bonding at least two optically transparent optical parts by an optically transparent adhesive layer formed by curing the adhesive composition of claim 1, wherein the value of refractive index of the adhesive layer was adjusted to approximate to the values of refractive index of the at least two optically transparent optical parts.

12. The optical device of claim 11, wherein when the refractive indices of the two adjacent optical parts are represented by n_1 and n_2 ($n_1 \geq n_2$), the adhesive layer between the adjacent optical parts has a refractive index n_3 represented by the following expression (1):

$$\sqrt{(n_1 \cdot n_2)} - ((\sqrt{(n_1 \cdot n_2)} - n_2)/3) - 0.05 \leq n_3 \leq \sqrt{(n_1 \cdot n_2)} + ((n_1 - \sqrt{(n_1 \cdot n_2)})/3) + 0.05$$

... (1)

13. The optical device of claim 11, wherein when the refractive indices of the two adjacent optical parts are represented by n_1 and n_2 ($n_1 \geq n_2$), the adhesive layer between the adjacent optical parts has a refractive index n_3 represented by the following expression (2):

$$\sqrt{(n_1 \cdot n_2)} - ((\sqrt{(n_1 \cdot n_2)} - n_2) / 4) - 0.03 \leq n_3 \leq \sqrt{(n_1 \cdot n_2)} + ((n_1 - \sqrt{(n_1 \cdot n_2)}) / 4) + 0.03$$

... (2)